

Claims

1. A method of treating and utilizing sludge, **characterized** in that therein:

5 in a first phase (1, 1A, 1B, 2) hydrophilic water binding sludge particles are caused to attach to the surface of hydrophobic organic grains, like hydrophobic grains of peat,

 in a second phase (4) the grains obtained thereby having a water-bearing layer of sludge particles on the surface thereof are dried to hydrophobize also the surface layer,

10 in a third phase (5) an essential portion of the hydrophobic grains obtained thereby are circulated back to said first phase of the method.

2. A method according to claim 1, **characterized** in that hydrophobic grains are circulated in the method 5 to 10 times on an average.

15 3. A method according to claim 1, **characterized** in that sludge particles are in said first phase caused to attach to the surface of hydrophobic organic grains by mixing hydrophobic grains with sludge (1) and by extruding (2) the mixture obtained.

20 4. A method according to claim 1, **characterized** in that sludge particles are in said first phase caused to attach to the surface of hydrophobic organic grains by filtering water including sludge by means of the grains (1A), by mixing the sludge-coated grains with hydrophobic organic grains according to need (1B) and by extruding (2) the mixture obtained.

25 5. A method according to claim 4, **characterized** in that grains hydrophobized again by drying are circulated back (5) to both the filtering (1A) and mixing (1B).

6. A method according to claim 1, **characterized** in that grains grown up or attached to each other in the circulation are split to smaller ones.

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7. A method according to claim 1, **characterized** in that the grains are composted (3) between said first phase and second phase (4).

35 8. A method according to claim 7, **characterized** in that the mixture is composted (3) as extruded to pieces in a continuously operating process in which the temperature of the

pieces is raised rapidly to the thermophilic range within which the composting is mainly carried out (Figs 5 and 8).

9. A method according to claim 1, **characterized** in that grains taken off from the circulation are coated.

10. A method according to claim 9, **characterized** in that grains taken off from the circulation are coated with one or more of the following materials: lime, ash, nutrient solution, clay, gypsum, silicon carbonate.

11. A method according to claim 1, **characterized** in that grains are coated with selected materials between cycles of circulation whereby a layer of said materials is formed in the inside of grains.

15. 12. A method according to claim 11, **characterized** in that a selected material is a solution or a mass including nutrients.

20. 13. A method according to claim 1, **characterized** in that substances affecting the properties of the grains are added to the sludge, the mixture of the sludge and hydrophobic grains, or the mixture of the sludge-coated grains and hydrophobic grains.

14. A method according to claim 13, **characterized** in that the added substances affect one or more of the following properties: nutrient content, solubility of nutrients, pH.

25. 15. The use of the method in biological treatment of waste water for removal of sludge and for providing carbon source and substrate for microorganisms.

16. The use of the method in manufacture of fertilizers.

30. 17. The use of the method in treatment of sludge for burning.